

A deepwater threadfin, *Polydactylus longipes* (Perciformes: Polynemidae), from Vanuatu: new record from the South Pacific

by

Hiroyuki MOTOMURA* (1), Patrice PRUVOST (2) & Romain CAUSSE (2)

RÉSUMÉ. - Présence d'un barbare longs-doigts, *Polydactylus longipes* (Perciformes: Polynemidae), au Vanuatu : nouveau signalement pour l'océan Pacifique sud.

Un spécimen de *Polydactylus longipes*, précédemment connu par trois exemplaires types en provenance des Philippines, a été collecté aux îles Vanuatu à une profondeur de 300-360 m. Ce spécimen est le premier signalement de *P. longiceps* en dehors des Philippines, élargissant la zone de répartition de 5000 km dans le sud-est par rapport à la localité type. La profondeur de cette capture de *P. longiceps* est la plus importante recensée pour la famille. Des changements morphologiques en relation avec la croissance allométrique de l'espèce sont également observés.

Key words. - Polynemidae - *Polydactylus longipes* - Vanuatu - Distribution - First record.

The family Polynemidae comprises eight genera with 43 species and subspecies worldwide (Motomura, 2004a, 2004b; Motomura and Tsukawaki, 2006; Lim *et al.*, 2010). The Indo-Pacific species of *Polydactylus* Lacepède, the most speciose genus in the family, were revised by Motomura (2002) who recognized 14 species as valid and synonymized 12 nominal species. Subsequently, Lim *et al.* (2010) described a new species of *Polydactylus* from Sarawak, Borneo. The genus *Polydactylus* is characterized by the pectoral-fin insertion well below the midline of the side of the body, eye diameter relatively large, lip present on the anterior part of the lower jaw,

anal-fin base length less than head length, pectoral-fin base (including pectoral-filament base) length less than upper-jaw length, and space separating the premaxillary tooth bands less than the width of each band (Motomura, 2004b).

The rarest species, *P. longipes*, was originally described by Motomura *et al.* (2001b) on the basis of three specimens (134-159 mm standard length) collected off Mindanao Island, the Philippines. Since then, neither additional specimens nor photographs of *P. longipes* have been reported. However, a single large specimen of *Polydactylus* collected from Vanuatu by a bottom trawl at 300-360 m depth, during the Boa 1 Survey of the Tropical Deep Sea Benthos Program, from 9 to 18 September 2005, led by the Muséum National d'Histoire Naturelle, Paris, was recently examined and confirmed as *P. longipes*. The specimen, herein described, represents the first record of the species from outside the Philippines.

Counts and measurements follow Motomura *et al.* (2001b) and Motomura (2004b). Pectoral-fin ray counts include only the rays interconnected by a membrane, the lower free rays are considered separately. Counts of pectoral-fin filaments begin with the anterior (ventralmost) element. Standard, total and fork lengths are expressed as SL, TL and FL respectively. The length of the pectoral-fin base was measured from the base of uppermost pectoral-fin ray to the base of the lowermost pectoral filament. The present specimen of *P. longipes* is deposited at the Muséum National d'Histoire Naturelle, Paris (MNHN).

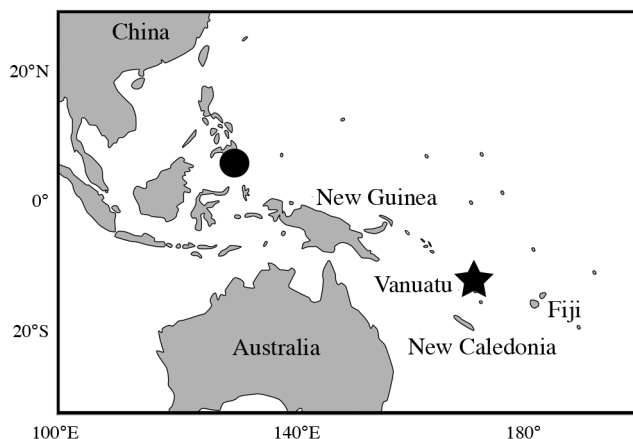


Figure 1. - Records of *Polydactylus longipes* in the South Pacific. Circle and star indicate capture localities of type specimens and the present specimen, respectively.

Polydactylus longipes
Motomura, Okamoto & Iwatsuki, 2001
(Fig. 2)

English name: Long-limb Threadfin; French name: Barbure longs-doigts.

Material examined

MNHN 2009-1448, 214.8 mm SL (240.5 mm FL, 293.2 mm TL), Big Bay, northern Espiritu Santo Island, Vanuatu, 15°06'05"S, 166°52'07"E, 300-360 m depth, bottom trawl, RV *Alis*, 10 Sept. 2005.

Description

Dorsal-fin rays VIII-I, 12; anal-fin rays III, 11; pectoral-fin rays 13; pectoral filaments 6 on each side of body; pelvic-fin rays I, 5; pored lateral-line scales 55; scales above lateral line 6; scales below lateral line 11; upper limb gill rakers 13, lower limb 20, total 33.

Body oblong, moderately compressed. Orbit diameter greater

(1) The Kagoshima University Museum, 1-21-30 Korimoto, Kagoshima 890-0065, Japan.

(2) UMR BOREA 7208, Département "Milieux et peuplements aquatiques", Muséum national d'Histoire naturelle, 43 rue Cuvier, 75231 Paris CEDEX 05, France. [pruvost@mnhn.fr] [causse@mnhn.fr]

* Corresponding author [motomura@kaum.kagoshima-u.ac.jp]



Figure 2. - *Polydactylus longipes* from Vanuatu (MNHN 2009-1448, 214.8 mm SL).

than both snout length and interorbital width. Maxilla covered with scales; posterior margin of maxilla extending slightly beyond a vertical through posterior margin of adipose eyelid; depth of posterior portion of maxilla less than eye diameter; lower lip well-developed. Villiform teeth on vomer, palatines and ectopterygoids; width of palatine plate much wider than that of ectopterygoid. All pectoral-fin rays unbranched; posterior tip of pectoral fin just short of a vertical through posterior tip of depressed pelvic fin. First pectoral filament shortest, first and second filament not reaching to posterior tip of depressed pelvic fin; third filament extending beyond anus; fourth filament reaching to midpoint of anal-fin base; fifth filament longest, extending well beyond midpoint of caudal peduncle; sixth pectoral filament extending slightly beyond midpoint of caudal peduncle. Thickness of second to fourth spine bases in first dorsal fin similar. Length of second dorsal-fin base slightly longer than that of anal-fin base. Distance between origins of pelvic and anal fins less than head length. Lateral line simple, extending from upper end of gill opening to upper end of lower caudal-fin lobe. Swimbladder simple, well developed.

Morphometrics

Head length 33.8% of SL; body depth at first dorsal fin origin 30.3; body depth at second dorsal fin origin 28.6; body width at pectoral fin base 13.8; snout length 6.1; eye diameter 8.1; orbit diameter 10.4; interorbital width 8.8; postorbital length 19.1; upper-jaw length 16.8; pre-first dorsal-fin length 37.7; pre-second dorsal-fin length 65.2; pre-anal-fin length 69.3; pelvic-fin origin to anal-fin origin 44.8; second dorsal-fin base length 14.6; anal-fin base length 12.9; longest pectoral-fin length 26.4; longest pectoral-filament length 72.4; pectoral-fin base including pectoral-filaments base 8.9; longest pelvic-fin ray length 18.2; longest first dorsal-fin spine length 18.2; second dorsal-fin spine length 10.5; longest anal-fin spine length 10.5; caudal-peduncle length 22.0; caudal-peduncle depth 12.1; upper caudal-fin lobe length 36.5; lower caudal-fin lobe length 32.6.

Colour of preserved specimen

Head and body dark gray dorsally, brown ventrally; opercular region distinctly black. First dorsal fin black anterodistally, whitish posteriorly. Pectoral-fin membranes semitransparent, melanophores scattered on rays; pectoral filaments gray. Posterior soft rays of second dorsal and anal fins whitish, remainder dark gray. Caudal fin gray, black marginally.

Remarks

Diagnostic characters of the Vanuatu specimen agreed with those given for *P. longipes* by Motomura *et al.* (2001b); viz., 13 pectoral-fin rays, all rays unbranched; 6 pectoral filaments, upper 2 filaments extending beyond midpoint of caudal peduncle; 55 pored lateral-line scales; 6 scale rows above lateral line, 11 below; vomerine teeth present; and grayish-black body. However, the former specimen differed slightly from the type series in having relatively shorter fin lengths, including pectoral-fin length 26.4% of SL (vs 27.8-29.1% in the latter), longest first dorsal-fin spine length 18.2% (vs 23.0-24.4%), upper caudal-fin lobe length 36.5% (vs 40.1-44.4%) and lower caudal-fin lobe length 32.6% (vs 35.0-40.2%). In addition, the longest pectoral filament in the Vanuatu specimen was the fifth (sixth in the type series). These minor morphometric differences appear to reflect changes related to allometric growth, the present specimen (214.8 mm SL) being much larger than the type series (134.1-158.9 mm SL).

Polydactylus longipes can be easily distinguished from other congeners by having 6 pectoral filaments, the 2 uppermost extending beyond the middle of the caudal peduncle, but not reaching to the caudal-fin base (Motomura, 2004b; Lim *et al.*, 2010). Detailed comparisons of *P. longipes* with other congeners were given by Motomura *et al.* (2001b), Motomura (2004b) and Lim *et al.* (2010).

The Vanuatu specimen represents the first record of *P. longipes* from outside the Philippines (an approximately 5000 km southeastward range extension), suggesting that *P. longipes* is widely distributed in the tropical western Pacific.

Since the type specimens of *P. longipes*, purchased at a fish market in Davao, Mindanao Island, lacked data for the depth of capture, the habitat of the species was unknown. However, the capture depth of the Vanuatu specimen (300-360 m) indicates that *P. longipes* is a deepwater species, being the deepest occurring member of the family (usually less than 50 m, rarely 100-150 m; Motomura, 2004b).

The pectoral fins of polynemids are their most distinctive feature, being divided into an upper part with the rays joined by membranes and a lower part with 3 to 16 separate rays (pectoral filaments), which have been considered to operate as a sense organ (probably acting as a substitute for eyesight), enabling polynemids to search for food in muddy water (Motomura *et al.*, 2002; Motomura, 2004b). In particular, species of *Parapolyneustes* Feltes and *Polynemus* Linnaeus, generally occurring in freshwater rivers and estuaries, have extremely long pectoral filaments (exceeding their total length) and extremely small eyes (2-5% SL) (Motomura, 2004b). However, some species of *Polydactylus* occurring in clear

open waters, like *P. sexfilis* Valenciennes, have short pectoral filaments (not reaching to the anal-fin origin in *S. sexfilis*) and large eyes (8-11% of SL in *S. sexfilis*) (Motomura *et al.*, 2001a). The unique specialization of long pectoral filaments (reaching to the middle of the caudal peduncle) and large eyes (8.1-9.2% SL) found in *P. longipes* appear to have arisen as an adaptation to the deepwater habitat of the species.

Acknowledgments. - We thank Philippe Béarez, Claude Ferrara, Zora Gabsi, Anne Previato, and all other staff of the Département "Milieux et peuplements aquatiques" at the Muséum national d'Histoire naturelle for their kind assistance. We greatly appreciated comments on the manuscript by Graham S. Hardy (Ngunguru, New Zealand). The first author's visit to Paris for two months in 2010 was supported by the Muséum national d'Histoire naturelle.

REFERENCES

- LIM P.K.A., MOTOMURA H. & GAMBANG A.C., 2010. - *Polydactylus luparensis*, a new species of threadfin (Perciformes: Polynemidae) from the Batang Lupar River, Sarawak, Borneo. *Zootaxa*, 2405: 63-68.
- MOTOMURA H., 2002. - Revision of the Indo-Pacific threadfin genus *Polydactylus* (Perciformes: Polynemidae) with a key to the species. *Bull. Natl. Sci. Mus., Tokyo, Ser. A (Zool.)*, 28(3): 171-194.
- MOTOMURA H., 2004a. - Family Polynemidae Rafinesque, 1815. Threadfins. *Calif. Acad. Sci., San Francisco, Annotated Checklists Fish.*, 32: 1-18.
- MOTOMURA H., 2004b. - Threadfins of the world (family Polynemidae). An annotated and illustrated catalogue of polynemid species known to date. *FAO Species Catalogue for Fishery Purposes* No. 3. vii + 117 p. Rome: FAO.
- MOTOMURA H., IWATSUKI Y. & KIMURA S., 2001a. - Redescription of *Polydactylus sexfilis* (Valenciennes in Cuvier and Valenciennes, 1831), a senior synonym of *P. kuru* (Bleeker, 1853) with designation of a lectotype (Perciformes: Polynemidae). *Ichthyol. Res.*, 48(1): 83-89.
- MOTOMURA H., OKAMOTO M. & IWATSUKI Y., 2001b. - Description of a new species of threadfin (Teleostei: Perciformes: Polynemidae), *Polydactylus longipes*, from Mindanao Island, Philippines. *Copeia*, 2001(4): 1087-1092.
- MOTOMURA H., SADO T. & KIMURA S., 2002. - Feeding behavior of *Polydactylus plebeius* (Perciformes: Polynemidae) in an aquarium. *Jpn. J. Ichthyol.*, 49(2): 156-157.
- MOTOMURA H. & TSUKAWAKI S., 2006. - New species of the threadfin genus *Polynemus* (Teleostei: Polynemidae) from the Mekong River basin, Vietnam, with comments on the Mekong species of *Polynemus*. *Raffles Bull. Zool.*, 54(2): 459-464.

Reçu le 3 août 2010.

Accepté pour publication le 17 novembre 2010.